

Claims

1. Radiation detection apparatus capable of detecting and locating events in a scene under surveillance comprising a detector array and a lens arranged to provide a single focussed image of a distant scene on the array, the apparatus further comprising a reflector situated between the plane of the array and the plane of the lens so as to extend the field of view by reflecting onto the detector array radiation entering the lens from outside the normally imaged field of view of the array-lens combination.
2. Apparatus as claimed in claim 1 in which the lens is plano-convex and the planar surface of the lens is directed towards the scene.
3. Apparatus as claimed in claim 1 in which the reflector has cylindrical symmetry about the optical axis of the lens.
4. Apparatus as claimed in claim 1 in which the reflector has one or more convex reflecting surfaces.
5. Apparatus as claimed in claim 1 in which the reflector has one or more planar reflecting surfaces.
6. Apparatus as claimed in claim 1 including one or more microprocessors or other processors which distinguish events in the extended field of view from those in the normally imaged field of view by means of appropriate pattern recognition algorithms.

7. Apparatus as claimed in claim 1 including a test source of radiation arranged to emit radiation onto the lens from outside the normally imaged field of view of the detector array.
8. Apparatus as claimed in claim 7 in which the source illuminates different elements of the detector array at different times
9. Apparatus as claimed in claim 7 including means for shielding the detector array from the test source
10. Apparatus as claimed in claim 7, including a further reflector arranged to reflect radiation from the test source towards the lens.
11. Apparatus as claimed in claim 10 in which the further reflector has one or more concave surfaces.
12. Apparatus as claimed in claim 10 in which the further reflector is frusto-conical.
13. Apparatus as claimed in claim 10 in which the further reflector has one or more planar reflective surfaces
14. Apparatus as claimed in claim 10 in which the further reflector has cylindrical symmetry about the optical axis of the lens.
15. Apparatus as claimed in claim 10 in which the reflector and the further reflector are arranged to reflect radiation onto the whole of the detector array

16 Apparatus as claimed in claim 7 in which the lens is protected by a window and the source is located inside the window

17 Apparatus as claimed in claim 16 in which the further reflector is located outside the window

18 Apparatus as claimed in claim 7 which the test source has means for modulating its output, whereby radiation from the test source can be distinguished from radiation from a scene being viewed

19 Apparatus as claimed in claim 7 including a microprocessor or other processor for commanding the automatic testing of the apparatus at intervals

20 Apparatus as claimed in claim 7 in which the test source comprises one or more emitters arranged about the optical axis of the lens

21 Apparatus as claimed in claim 7 in which the source comprises one or more electrically heated filaments

22 Apparatus as claimed in claim 7 in which the test source comprises a refractory metal film deposited on a substrate

23 Apparatus as claimed in claim 16 in which the test source comprises a refractory metal film deposited on a substrate and the substrate is the window

24 Apparatus as claimed in claim 7 in which the test source is a single continuous

radiating element with circular symmetry about the optical axis of the lens.

25. Apparatus as claimed in claim 7 in which the source comprises one or more light emitting diodes.

26. Apparatus as claimed in claim 1 in which the array is an array of thermal detectors.

27. Apparatus as claimed in claim 26 in which the array is an array of pyroelectric detectors.

28. Apparatus as claimed in claim 1 in which the detector array is formed in or mounted on a semiconductor integrated circuit that is used to interrogate it.